

*Annual Review of Ecology and Systematics*. By RICHARD F. JOHNSTON, PETER W. FRANK, and CHARLES D. MICHENER, Eds. Vol. 1, 1970. ix + 406 pp. Annual Reviews Inc., Palo Alto. \$10.

The Annual Reviews of Plant Physiology, Genetics, Entomology, and other fields of science are familiar to most of us. These apparently successful presentations are now to be joined by the Annual Review of Ecology and Systematics. The first volume of this new series was prepared under the editorial leadership of 5 animal ecologists, 2 plant ecologists, and 1 systematic entomologist. Therefore, the resulting poor emphasis on plant systematics should come as no surprise.

The first question to cross the mind of many readers of this volume will be: why? The diffuse and complicated field of ecology is immediately apparent to anyone who pages through the bulk of the journal, *Ecology*. The vast assemblage of subjects in this field does not present the cohesive units that characterize, for example, the major fields of plant physiology. Therefore, an annual review of ecology, by itself, would appear to be an almost unreachable objective. This judgment is borne out in the content of the first volume which includes 15 papers covering topics on philosophy, population genetics, anthropology, and endogenous rhythms as well as on plant ecology (4 papers), animal ecology (3 papers), plant systematics (3 papers), and animal systematics (1 paper).

Papers on plant systematics include: "Analysis of character variation in ecology and systematics", by Theodore J. Crovello; "Chemosystematics and ecology of lichen-forming fungi", by William Louis Culberson; and "The shapes and sizes of seeds", by J. L. Harper, P. H. Lovell, and K. G. Moore.

Crovello addresses his topic to those who wish to adapt ecological and systematic information to computer technology. It doubtless will be helpful to workers in that field. However, your reviewer is somewhat puzzled by a paper carrying this title but which fails to mention (among the 286 literature citations) such exemplary character variation studies as those of Woodson on *Asclepias*, or of Hall on *Juniperus*. It is amazing that a paper on this subject directs no comment to the various genetic systems, such as additive genes, epistatic genes, and complementary genes that regulate character expressions and variation. On the other hand, the author carefully emphasizes the obvious importance of punching the data cards by a compatible system for the rapid pooling and extraction of information.

The Culberson paper is only marginally systematic. In 16 pages it gives a good morphological, ecological, and chemosystematic treatise of lichens, one that would be most helpful in developing lecture material for a survey course on the non-vascular plants.

The paper by Harper, Lovell, and Moore is far more than an essay on the sizes and shapes of seeds. The topic is discussed in terms of seed production, genotypic control of seed size and shape, seed polymorphism, and ecological aspects of seed size and shape. In view of the highly significant but often neglected relationships that seeds have to evolution and systematics, this paper must be viewed as a useful contribution. It is supported by an impressive array of 117 literature citations.

It may well be that the most significant paper in this volume is "The units of selection" by R. C. Lewontin, who presents an erudite discussion of the selection of molecules, organelles, cells, gametes, individuals, and populations. One wonders why this paper could not have been included in the Annual Review of Genetics.

Hopefully, future volumes of this series will include such subjects as character displacement, protein electrophoresis, scanning electron microscopy, modern studies of pollen morphology, and other topics of pertinent systematic interest. However, the reviewer's unhappy conclusion is that the first volume will appeal primarily to ecological bibliophiles who think in terms of an unbroken set of the series rather than of selective, qualitative considerations. Good review papers involve much labor and time. It is to be hoped that the editors of this series will be able to accomplish the necessary planning and sufficiently advanced commitments to provide these vital requisites for a successful and meaningful series.—GEORGE W. GILLET, Department of Biology, University of California, Riverside 92502.